Comparative studies of multi-scale convective transport through the Earth's plasma sheet

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In this talk we will explore multi-scale, convective transport through the Earth's plasma sheet using *in situ* observations and global terrestrial magnetospheric simulations. We statistically test the Lyon-Fedder-Mobarry (LFM) global magnetohydrodynamic (MHD) model with observations from the Geotail spacecraft at a variety of spatial and temporal scales within the plasma sheet. These comparisons, in addition to quantifying the LFM range of validity, illuminate model shortcomings and highlight the additional physics necessary to resolve data/model discrepancies. Specifically, we will describe comparisons of global-scale plasma moments, magnetic fields, and bulks flows within the plasma sheet. By characterizing the LFM plasma sheet velocity distribution as a function of simulation resolution, we find that increased resolution inherently changes the nature of the dynamics and transport within the LFM plasma sheet, bringing it into closer agreement with magnetotail observations containing fast, localized bulk flows. Using our comprehensive Geotail data set, we also investigate the equatorial distributions of fast, convective flows and find a robust dawn-dusk asymmetry, with fast flows more frequently observed on the dusk-side of the plasma sheet, and speculate about potential causes.

Brief Biography:

I plan to graduate from Boston University in September, 2006, earning a Ph.D. under Harlan Spence within the Center for Integrated Space Weather Modeling (CISM). My graduate work involved comparative studies of the terrestrial plasma sheet using both Geotail observations and global MHD simulations, and will provide the majority of the material described in this seminar. I'll be taking a position with the Aerospace Corporation after the completion of my degree.